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Translation- and interpretation-related matters: utilization of new technologies

Translation and interpretation-related matters: utilization of new technologies

Report of the Secretary-General

I. Introduction

1. In paragraph 1 of section D of its resolution 54/248 of 23 December 1999, the General Assembly requested the Secretary-General "to continue the efforts to utilize new technologies, such as computer-assisted translation, remote translation, terminology databases and speech recognition, in the six official languages so as to enhance further the productivity of conference services, and to keep the General Assembly informed of the introduction and use of any other new technology".

2. The present report has been prepared in response to that request. It accordingly focuses on technologies of direct interest to language staff and does not include information on innovations, or enhancements of existing systems, aimed at streamlining the management of the documentation processing line or the management of meetings services, such as work-flow and assignment management systems. Nor does it cover changes or enhancements planned for the Optical Disk System, the technical aspects of which are not within the purview of the Department of General Assembly Affairs and Conference Services. Matters related to remote interpretation and to the posting of material on the United Nations web site are the subject of separate reports.

3. The report describes the status of projects falling within the main categories mentioned in section D of General Assembly resolution 248 (computer-assisted translation, remote translation, speech recognition and terminology databases) and outlines anticipated developments. It also contains information on the application of digital sound recording of meeting proceedings to the verbatim reporting function and on the potential extension of the use of that technology to other functions, such as the preparation and translation of summary records. Lastly, the report outlines plans for the application of emerging technologies, such as the synchronous display of two language versions of the same document and the integration of "tools" available to language staff through the application of the latest advances in Web-based technology.

4. An attempt has been made to identify the proven or expected impact of the various technologies covered by the report, bearing in mind the concern expressed by the General Assembly in paragraph 22 of its resolution 53/208 B of 18 December 1998 that the introduction of new technologies should have "no adverse effect on the quality of documentation and translation" and the expectation expressed by the Assembly in section D,

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paragraph 1, of its resolution 54/248 that new technologies should "enhance further the productivity of conference services".

II. Ongoing technology projects

A. Computer-assisted translation

Background

5. Although the Committee on Conferences has, in recent years, been kept informed through oral reports, and during its substantive session of 1999 through a demonstration, of the genesis and progress of the computer-assisted translation (CAT) project of the Translation and Editorial Division, its purpose and major stages are outlined below:

(a) Based on translation-memory technology, CAT aims at partially automating the retrieval of previously translated material which may be "recycled" in new documents. It does not purport to automate in any way the translation process itself, and parts of documents not previously translated will continue to be translated through conventional methods. In view of the fact that many United Nations documents include portions of older, previously translated documents, the search and retrieval of such "reference" material has been entrusted to the Terminology and Reference Section of the Translation and Editorial Division, which centralizes for all target languages the preparation of (hard-copy) reference folders for most translation jobs. The referencing function is essential for avoiding the costly retranslation of material extracted from previously issued documents; it is to be noted that such previously translated material is duly deducted from translation workload statistics. The introduction of CAT will result in the gradual replacement of hard-copy reference folders with electronic reference folders containing "aligned" files of reference documents in the relevant languages. "Alignment" is a process whereby "segments" (usually sentences) of a document in its original drafting language are matched with the equivalent segments in the target languages. Thanks to this process, it is possible for a translator to automatically retrieve previously translated segments from a relevant electronic reference folder and to automatically retrieve appropriate terminology from integrated dictionaries;

(b) In order to avoid duplication of efforts among conference-servicing centres, it was decided that Headquarters would take the lead in the introduction of CAT technology, the application of which would be extended to other duty stations if warranted by the results of an initial operational project. Following a review of the experience of other organizations (notably the European Union) in the area of CAT, four software packages were subjected to an extensive and detailed function-by-function analysis from the end of 1997 to the end of 1998;

(c) A choice was made between the three major contenders at the end of 1998, based on the following criteria:

(i) Degree of coverage of the official languages of the United Nations;

(ii) Degree of commitment of software vendors to further enhancing and developing their respective CAT products, and to take into account the special requirements of the United Nations;

(iii) Technical features of the respective software packages, including flexibility in translation-memory management, potential for customization of functions, degree of integration of software components (alignment tool, pre-translation, terminology/dictionary management);

(iv) Suitability for the existing United Nations information technology environment and ability to accommodate foreseeable changes in that environment (such as the adoption of new text-processing software and the introduction of speech recognition);

(v) Adherence to standards, protecting investments in the building of translation memories and specialized dictionaries from obsolescence in the event of a change of CAT software in the future;

(vi) Cost of software, software maintenance and related services, such as training and technical support;

(d) The software package selected (Star/Transit) was, at the time the decision was made, the only one to provide maximum flexibility in translation-memory management and, more importantly, to be offered with a firm commitment to cover all six official languages;

(e) A one-year contract covering the procurement of 50 software licences, three series of training sessions (basic, advanced and follow-up) and technical support was awarded to Star A.G. in late June 1999;

(f) Basic training in the use of Transit release 2.7 was initiated in July 1999. The CAT project had reached that stage when it was orally reported on at the 1999 substantive session of the Committee on Conferences.

6. As a result of the announcement in August 1999 of a major new release of the Transit software the following month, including a new and fully functional Arabic language version, it was decided to suspend training. However, it turned out that the software vendor had seriously underestimated the amount of time necessary for a complete overhaul of the software, including conversion into a 32-bit application and integration of the latest standards for page-description language (XML) and translation-memory and terminology exchanges.

7. The long delay in completing the development of the new release of the software did halt progress in the implementation of the CAT project, as it would have been futile to continue training and initiate the operational phase using the "old" version of Transit. However, the impact of the delay was far from entirely negative, as a few members of the project implementation team, particularly one staff member proficient in computational linguistics, performed in-depth evaluations of interim releases of the new software and were thus able to significantly influence the development process so as to ensure the inclusion of enhancements essential to meeting the requirements of the United Nations.

8. In view of the delay in releasing Transit 3.0, the vendor agreed to extend the original contract through March 2000, at no additional cost to the United Nations.

9. Following the commercial release of the new version of Transit (release 3.0) in March 2000, training was re-initiated from the basic stage, involving a total of 45 translators and 45 support staff representing all six official languages. Basic training included six two-day sessions and six one-day follow-up sessions. It was followed by expert training for a limited number of translators expected to act as focal points for their respective languages, for terminologists and for language reference assistants. Follow-up expert training will take place after several months of actual use of the software.

10. After completion of initial training, in early July, the CAT project entered its operational phase, involving the selection of suitable documents to be processed simultaneously in all translation languages by members of the project implementation team. Progress is being monitored through regular meetings of members of the team at the level of the respective translation services, as well as meetings of "focal points" designated in all translation services and in its Terminology and Reference Section.

Initial findings and potential benefits

11. At the early stage of CAT implementation, it is obviously impossible to offer definitive conclusions. Indeed, the purpose of the current, limited-scale project is to determine workflow and process changes that would be required for expanding the use of CAT, as well as the proportion of documents suitable for CAT processing and the possible impact of CAT technology on the quality of translations and the efficiency of the translation process as a whole. However, a number of findings have already emerged:

(a) Although the procurement of software licences, training services and support services represents a fairly modest investment (less than $170,000 for the current project), the training of staff, the building of translation memories from existing documents and the conversion of existing terminology data to the format required for inclusion in CAT dictionaries involve a considerable investment in staff-time. While the commitment and dedication of staff members involved in the CAT project has allowed for the implied costs to be largely absorbed, such costs would definitely have to be taken into consideration if the expansion of CAT usage were contemplated;

(b) Potential benefits in the form of improved consistency of usage within and across documents can definitely be expected;

(c) In view of the relative complexity of the CAT software and the fact that staffing constraints limit the potential for building translation memories from existing documents, the impact of CAT usage on productivity, if any, will only become clear after a longer period of operation. The method of validation of translation memories consisting of material subject to

revision after CAT processing may have cost implications;

(d) The wider use of CAT technology would have an impact not only on the working methods, but also on the duties, of the occupational groups involved;

(e) The expansion of CAT usage would require that all stages of document processing upstream of translation, including submission and pre-editing, which are currently hard-copy based, be performed electronically;

(f) Regardless of whether or not the outcome of the initial operational phase of the CAT project will suggest the expansion of CAT usage, the introduction of translation-memory technology will have had a very positive impact in speeding-up the transition from hard-copy-based referencing of translation jobs to electronic referencing (see para. 12 below). Electronic referencing will enhance the efficiency of the process, allowing more thorough and comprehensive search and retrieval of relevant material, eliminating the need to make thousands of photocopies for inclusion in reference folders, and facilitating the provision of reference material to remote contractual translators.

B. Remote translation

12. Remote translation, initiated on a limited scale over five years ago, has now become the norm at Headquarters, the United Nations Office at Geneva, the United Nations Office at Nairobi and the United Nations Office at Vienna for servicing meetings held away from those major United Nations conference-servicing centres. The only notable exception is the servicing of meetings involving a drafting exercise (usually for the preparation of documents of a legal nature) for which the presence on location of language experts is specially requested.

13. The usual arrangement for remote processing of documentation is to have translation and text-processing done at a major conference-servicing centre (and sometimes, for smaller meetings, at the headquarters of a regional commission), while the documents control function is shared between the location of the meeting being serviced and the remote servicing location.

14. The technology used for remote translation has evolved from a facsimile-based system for transmissions both from and to the location of the meeting to a more sophisticated system involving the transmission by facsimile of material to be translated, and the return of completed translations in the form of text-processing files, sent initially through a dedicated modem-to-modem connection, and now, in almost all cases, over the Internet. Transmission of files over the Internet as e-mail attachments, although the simplest method, is also prone to delays and breakdowns. It is therefore increasingly being replaced with transmission to and from a dedicated File Transfer Protocol (FTP) server, which offers greater speed and reliability. Dedicated FTP sites exist at Headquarters and at the United Nations Office at Geneva. In all cases, provision is made for a facsimile back-up system in the event of a breakdown in Internet communications.

15. One of the constraints resulting from the transmission of translations in the form of text-processing files to the location of the meeting is that capacity must be available locally to print the files in all languages, which makes it necessary to have on location computers and printers configured for all software/language combinations, as well as staff capable of checking the integrity of received documents before they are reproduced. The possibility of transmitting files in Portable Document Format (PDF) is currently being studied. Such an approach would considerably simplify the technical set-up and staffing requirements at the receiving end.

16. Benefits resulting from the systematic use of remote translation are primarily considerable savings on travel and daily subsistence allowance costs; as an indication, it was not unusual, in the past, to assign more than 60 translators and 30 text processors to service a major United Nations conference. It is to be noted that such cost-savings accrue mostly to Member States who agree to host United Nations meetings and are charged for the difference between the cost of servicing the meeting at an established United Nations conference-servicing centre and the cost of holding it at the hosting location. Remote translation also allows more efficient use of staff resources, as the staffing level for both translation and text-processing can be flexibly adjusted to match fluctuations in demand. Other benefits may include speedier delivery of translations if the time difference between the location of the meeting and the remote-servicing location is favourable.

17. Possible drawbacks include delays in processing translations or the need to establish special shifts at the servicing location when the time difference is unfavourable, and difficulties occasionally encountered by translators for lack of direct contact with delegations and with the substantive secretariat of the remotely serviced meeting.

18. The Department of General Assembly Affairs and Conference Services is currently reviewing existing guidelines governing the allocation of responsibilities between major conference-servicing centres for the servicing of meetings held away from such centres, with a view to replacing a system based on geographical criteria with one whereby the servicing centre, for translation, would normally be the one where the substantive secretariat of the meeting to be serviced is located, which would ensure that translations would be done by staff fully conversant with the subject matter of the meeting.

19. Similarly, as part of efforts to enhance cooperation between major conference-servicing centres, consideration is being given to remotely translating from the location of its substantive secretariat material needed by an organ or body meeting in a major conference-servicing centre other than the location of its established headquarters.

C. Speech recognition

20. Considering that a significant proportion of translators and verbatim reporters continue to dictate all or part of their work, and that dictation remains the most efficient inputting method for fairly easy material, the Department of General Assembly Affairs and Conference Services, in recent years, had been monitoring progress made in speech recognition technology, including through inter-agency meetings, such as the Inter-Agency Meeting on Language Arrangements, Documentation and Publications (IAMLADP) and its working group on the improvement of practices in the translation process. In early 1999, as the technology appeared to have matured sufficiently, it was decided that speech recognition would be formally tested and gradually introduced if warranted by test results. The United Nations Office at Geneva was designated as the lead conference-servicing centre for the introduction of speech recognition technology.

21. In the fall of 1999, controlled testing of speech recognition software was organized at the United Nations Office at Geneva for three languages (English, French and Spanish). Prior to testing, training was provided by a consultant. The initial results proved positive enough to warrant limited deployment and the development of dictionaries specific to categories of documents routinely processed at the United Nations Office at Geneva, which will eventually improve recognition rates.

22. Drawing on the experience gained at the United Nations Office at Geneva, the Translation and Editorial Division and the Verbatim Reporting Service at Headquarters organized induction sessions for a total of 13 staff members, and covering the two main speech recognition software packages currently available.

23. The assessment of speech recognition software was based not only on the rate of recognition (which is not significantly different between the two major packages available), but also, and more importantly, on the user-friendliness of the interface, the ease of correcting recognition errors, the ability to improve recognition rates through the addition of specialized dictionaries and the ease of creating and using voice-triggered macros.

24. Based on those criteria, Dragon Naturally Speaking Professional was found to be the best of the two major software packages (the other one being IBM's Via Voice) for English, French and Spanish. For Arabic, only IBM's Via Voice is available. For Chinese, the relevant version of Dragon Naturally Speaking Professional has just been released and still has to be compared with the Chinese version of IBM's Via Voice. No speech recognition software is yet available for Russian.

25. Deployment of speech recognition software has begun at Headquarters in the Translation and Editorial Division and the Verbatim Reporting Service. A consultant is providing installation and training services. The number of users, initially some 20, will be gradually increased.

26. Benefits of the introduction of speech recognition technology will accrue downstream of the translation process, in text-processing units, where the transcription of translations, original summary records and verbatim records recorded on audio cassettes still constitutes a very significant proportion of the total

workload. Savings in overtime costs may be expected in the medium term.

D. Terminology databases

27. At all major conference-servicing centres, terminology resources consist of: databases centrally maintained by a terminology unit, usually a general nomenclature available in all official languages and a number of multilingual specialized glossaries; bilingual glossaries prepared within translation services or sections; a compendium of databases shared among organizations represented at IAMLADP, including United Nations agencies and other intergovernmental organizations, under a terminology exchange agreement.

28. Centrally maintained databases, such as UNTERM at Headquarters, had until recently to reside on a mainframe computer in order to facilitate the printing of multilingual glossaries. Thanks to advances in technology, it has been possible to migrate such databases to a more flexible personal computer-based environment.

29. Bilingual databases maintained by individual translation services/sections are usually in the form of text files, which are indexed and searched using a full-text search engine.

30. Terminology resources shared among organizations represented at IAMLADP are in a variety of formats owing to the diversity of sources. They are indexed and searched with the same search engine used for glossaries generated by individual translation services or sections. A password-protected Internet site maintained by the United Nations Office at Geneva is used by organizations participating in the sharing arrangement for posting and downloading terminology material and for searching across selected databases.

31. The application of new technologies to the management of the above-mentioned terminology resources focuses on two main concerns:

(a) The need to convert selected databases to the format required for inclusion in CAT dictionaries, a task undertaken as part of the CAT project; the terminology management module of the CAT software, which offers powerful features, allows for easy import/export of data to and from other major database management systems, and conforms to recent International Organization for Standardization (ISO) standards on terminology data exchange, may become the United Nations standard for structured terminology databases if the CAT project is expanded;

(b) The need to ensure the widest possible access to all terminology resources at all duty stations. That requirement, previously met, albeit partially, through the exchange of files and the distribution of periodically updated compilations on CD-ROMs, can best be fulfilled through the wider use of Web-based technology. As previously reported orally to the Committee on Conferences, a selection of multilingual glossaries from the UNTERM database centrally maintained at Headquarters has been available for some time to language staff and other potential users on the United Nations Intranet, and consequently accessible from all duty stations connected to the United Nations Extranet, which is expected to cover all duty stations with language staff by the end of the current year. Recent technological advances, notably the inclusion of UNICODE support in the latest releases of the Windows operating system and advances in XML technology, have eliminated major limitations to the use of Web-based technology for the dissemination of terminology data, in particular by solving the problem of displaying and printing pages containing text in both Roman and non-Roman languages. As a result, the feasibility of a single Intranet/Extranet gateway for searching terminology databases, regardless of their source, is being actively explored. Password-protected Internet access for contractual translators, remote verbatim reporters and other potential users is also being contemplated.

E. Electronic referencing

32. As mentioned above in paragraph 11 (c), a shift from hard-copy-based referencing of translation jobs to electronic referencing is a key component of the CAT project. The use of CAT software will, in time, result in the building up of a collection of aligned reference documents (translation memories). However, making available to translators, interpreters, verbatim reporters and language reference assistants a large multilingual collection of searchable reference documents, with synchronized scrolling of two language versions displayed side by side, would offer major benefits for the quick identification of relevant reference material and the extraction of terminology. It is to be noted that

the Optical Disk System, while offering a full-text search capability, only displays lists of relevant documents, which must then be opened and searched individually. Drawing upon the experience of two other intergovernmental organizations (the European Union and the World Trade Organization), the Translation and Editorial Division, with the support of the Information Management and Technology Unit of the Department of General Assembly Affairs and Conference Services, has undertaken to establish a system similar to those used by the two organizations (DtVista and TAS). The initial stage of the project, providing for access by language staff to a fully indexed and searchable multilingual collection of documents covering several years, is being implemented at no development cost. The feature allowing for parallel display and synchronized scrolling of two language versions will be added later.

F. Use of digital audio recording technology

33. A system allowing digital recording of meeting proceedings has been developed and implemented over the past few years by the Verbatim Reporting Service in the Interpretation, Meetings and Publishing Division. The main purpose of the system was to allow easy and speedy transmission of the recordings of meetings proceedings, in the form of digital sound files playable on any modern personal computer to remote freelance verbatim reporters, together with relevant reference material. Completed verbatim records would then be returned by remote freelancers as text-processing files. The project involved gradually phasing out the recording on analog audio cassettes of timed segments of meeting proceedings (so-called "takes"), in the language of delivery and in the five interpretation languages, and using instead digital recording technology to generate and store "takes" in a standard compressed audio file format. Sound files are made instantly available to remote verbatim reporters on a secure FTP site accessible via the Internet, which makes it possible to resort to remote temporary assistance even for the preparation of verbatim records subject to tight deadlines.

34. The project, developed in-house at no significant cost and involving a modest investment in hardware, has already more than paid for itself by significantly reducing the need to bring on board costly internationally recruited freelance verbatim reporters. A portable version of the digital recording, storage and transmission system was recently developed and used successfully to service the special session of the General Assembly on the follow-up to the World Summit for Social Development, which took place at the United Nations Office at Geneva, where no established verbatim reporting capacity is available.

35. As an extension of the original project, audio cassettes have been phased out as a means of distribution of "takes" to in-house verbatim reporters, who also retrieve recordings as digital sound files. A similar approach is being contemplated for the distribution to précis-writers and translators of recordings of proceedings of meetings of bodies entitled to summary records.